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Case Report

Successful Management of Acute Ischemic Stroke with Intravenous Thrombolysis and Implementation of Prehospital Stroke

Ni Made Ayu Candrayuni[1] ✉, Deddy Andaka[1]

[1] Siloam Hospital, Bali, Indonesia.

Corresponding Author:
Ni Made Ayu Candrayuni
Siloam Hospital, Bali, Indonesia
Email: madeayucandrayuni@gmail.com

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Introduction: Acute ischemic stroke (AIS) is a leading cause of disability and death worldwide. Timely administration of intravenous thrombolysis (IVT) significantly improves patient outcomes when delivered within the therapeutic window. Prehospital stroke care encompass the period from symptom onset to hospital arrival and includes both patient-to-hospital and inter-hospital transfers. Delays in prehospital stroke care represent a significant barrier to effective treatment. **Case:** A 68-year-old male presented with sudden left-sided weakness and slurred speech. A CT scan performed one hour after symptom onset showed no acute abnormalities (ASPECTS 10). He was transferred to the hospital 3.5 hours post-onset and received alteplase (67.5 mg). His door-to-needle time was 20 minutes, with an onset-to-needle time of 3 hours and 50 minutes. The patient showed significant improvement, with his NIHSS score decreasing from 11 to 2 within 30 minutes. **Conclusion:** Integrating IVT with robust prehospital stroke services enhances treatment efficiency and improves functional outcomes, setting a benchmark for optimal stroke management.

Keywords: Alteplase, Health system, Ischemic stroke, Prehospital stroke care, Thrombolysis

Highlights
- Timely thrombolysis led to major neurological improvement in stroke patient.
- Early recognition and prehospital care enabled rapid stroke intervention.
- Case shows value of prehospital stroke systems for thrombolysis success.

Introduction

Stroke is a global health concern, causing approximately 6.17 million deaths annually.[1,2] The time between symptom onset and treatment for ischemic stroke is critical in determining patient outcomes.[3] Timely reperfusion is essential to prevent irreversible brain damage. Intravenous recombinant tissue plasminogen activator (IV rtPA) is the most effective and widely approved treatment for acute ischemic stroke when given within the therapeutic time window.[4]

Efficient prehospital stroke care—including rapid identification, early notification, and coordinated interhospital transport—is critical for optimizing thrombolysis and improving clinical outcomes.[5] In Indonesia, the implementation of such systems remains limited due to low public awareness of stroke symptoms and underdeveloped emergency medical services, particularly in rural areas.

This case study highlights successful ischemic stroke treatment with intravenous thrombolysis, facilitated by effective prehospital coordination with the referring hospital.

Case

A 68-year-old foreign male was referred from Bali Mandara Hospitals with sudden left-sided weakness and slurred speech at 08:00 AM. A CT scan performed one hour after onset showed no signs of acute infarction, hemorrhage, or dense artery signs (ASPECTS 10) (Figure 1). His condition deteriorated, leading to paralysis and muscle contractions, prompting referral for thrombolysis.

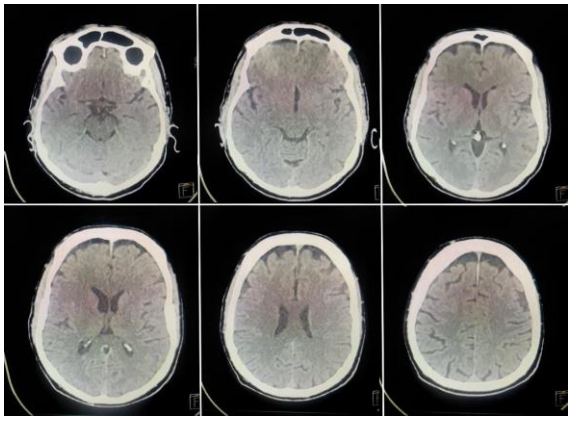

Figure 1. CT scan of the head one hour from onset showed no acute infarct, haemorrhage, or dense sign with ASPECTS 10.

The referring hospital completed reports on the patient's condition and completed the laboratory testing prior to thrombolysis, all of which had been sent to the receiving hospital before the patient's arrival. He arrived at Siloam Hospital at 11:30 PM (3.5 hours post-onset). A brief reassessment showed the patient was alert with GCS score of E4V5M6 and stable vital signs. A head-to-toe examination revealed no abnormalities. Despite cranial nerve deficits and muscle weakness, sensory function and reflexes were intact, except for a left-sided Babinski reflex. Thrombolysis with alteplase (67.5 mg) was initiated within 20 minutes of arrival. The patient's condition improved within 30 minutes, with increased limb movement and a reduction in NIHSS score to mild stroke classification.

Post-thrombolysis MRI/MRA revealed an acute infarction in the right corona radiata and basal ganglia, along with minimal hemorrhage in the right putamen (Figure 2). He was monitored in the High Care Unit, and a follow-up CT scan was conducted 24 hours later.

Discussion

Intravenous thrombolysis with rtPA is effective in restoring blood flow and improving neurological outcomes when administered within 4.5 hours of symptom onset.[6-8] Recent studies also support the benefits of thrombectomy for large-vessel occlusions.[9] However, prehospital stroke care is often overlooked in efforts to improve ischemic stroke outcomes.

Prehospital stroke care encompasses the time from symptom onset to hospital arrival, including both patient-to-hospital and inter-hospital transfers. The American

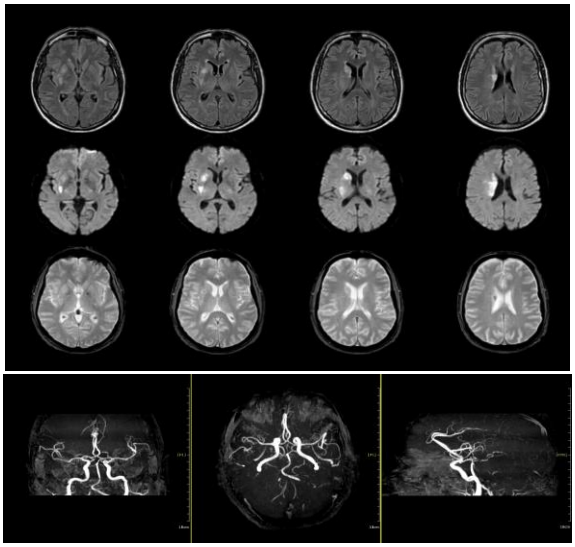

Figure 2. MRI MRA of the head without contrast showing acute infarction of the right corona radiata and right basal ganglia with minimal haemorrhage in the anterior aspect of the right putamen

Heart Association (AHA) recommends structured prehospital management, including early stroke screening, pre-arrival hospital notification, and thorough documentation. These measures improve coordination between hospitals and enhance treatment efficiency.[10,11] A study by Layne Dylla *et al.* found a strong correlation between adherence to AHA guidelines and shorter door-to-CT times.[12] Simple screening tools from AHA and European Federation of Neurological Societies (EFNS) help medical staff quickly identify stroke patients, while early notification allows hospitals to prepare for immediate thrombolysis.[12,13] Careful evaluation of contraindications is also essential when selecting candidates for thrombolytic therapy.[14]

Elvan Wiyarta *et al.* reported that low- and middle-income countries (LMICs) face significant barriers in prehospital stroke care, including low public awareness, cultural factors, limited EMS systems, and inadequate healthcare infrastructure. These factors contribute to treatment delays and poorer outcomes. Adopting strategies from high-income countries—such as public education, improved EMS, and cost-effective technologies—may help reduce these delays.[15] This highlights the importance of strengthening early stroke management systems to maximize treatment success, especially in resource-limited settings.

Conclusion

This case report highlights the successful management of acute ischemic stroke using intravenous thrombolysis with effective prehospital coordination. An onset-to-needle time of 3 hours and 50 minutes and a door-to-needle time of 20 minutes ensured timely treatment, leading to significant neurological improvement without complications. Proper prehospital management, including early screening and referral preparation, played a crucial

role in optimizing therapy. This case underscores the importance of an integrated prehospital stroke care system in improving patient access to timely treatment and enhancing clinical outcomes.

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Conflict of Interest
The authors declare no conflicts of interest related to this case report.

Patient consent for publication
Written informed consent was obtained from the patient (or their legal representative) for the publication of this case report, including relevant clinical details and images.

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None.

Author contribution
Ni Made Ayu Candrayuni: Conceptualization, Data curation, Investigation, Validation, Writing–original draft. **Deddy Andaka:** Conceptualization, Data curation, Formal analysis, Supervision, Validation, Writing–review and editing.

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